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Intergovernmental  
Oceanographic  
Commission



MARSHALL ISLANDS TSUNAMI WARNING AND PREPAREDNESS, MAJURO TSUNAMI READY  
Tsunami Warning and Preparedness Strengthening Workshop  
13-14 January 2026  
Majuro, Republic of Marshall Islands

# UNESCO IOC Global Tsunami System

## ICG/PTWS, Roles of TNCs, TSPs, TWFPs, NTWCs, and TICs

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Dr. Laura Kong

Director

International Tsunami Information Center



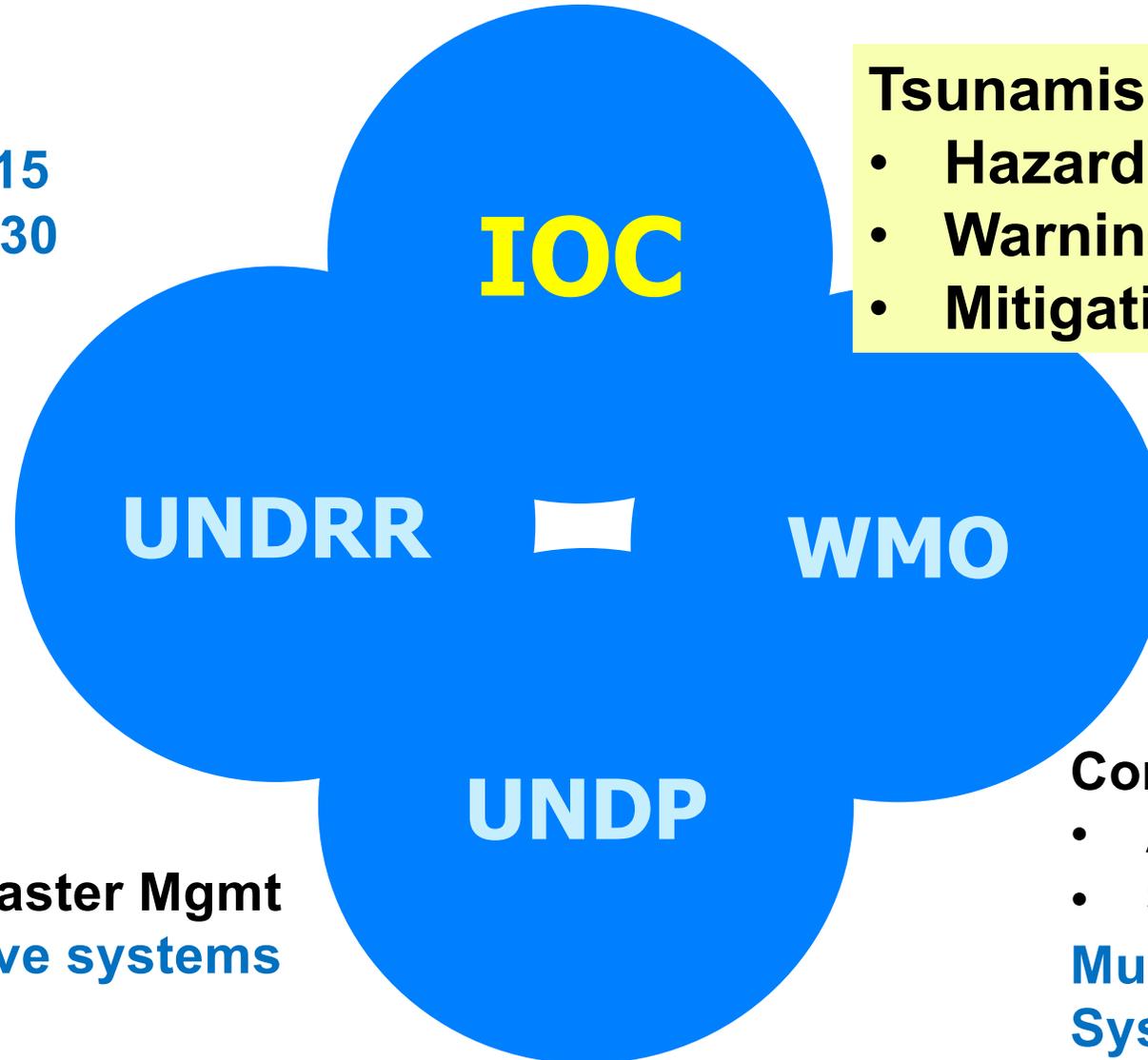
# UN – Global Partnerships

## DRR platforms

- Hyogo 2005-2015
- Sendai 2015-2030

## Awareness

- DRR Oct 13
- WTAD Nov 5



## Tsunamis:

- Hazard Risk
- Warning guidance
- Mitigation, Preparedness

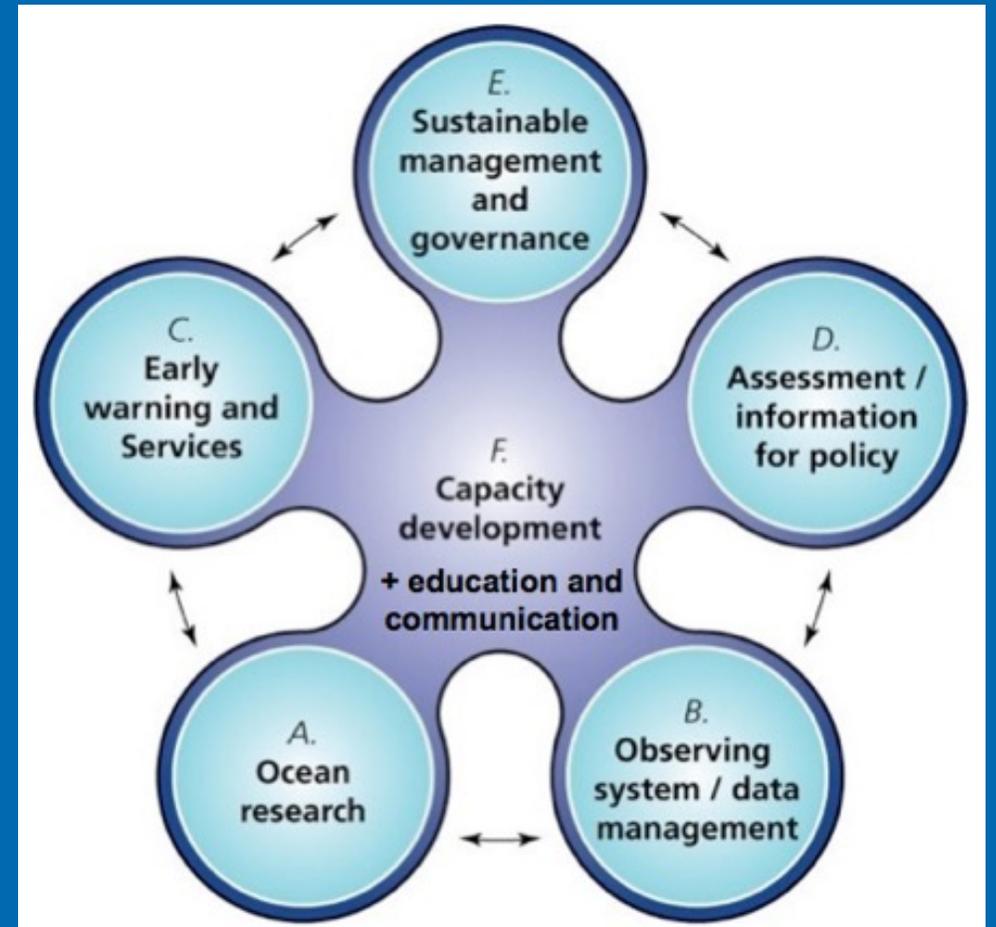
**Disaster Mgmt**  
Institutional / Legislative systems

## Communication (GTS)

- Alerts
  - Sea Level Data
- Multi-hazard Early Warning Systems (MHEWS)**

# Intergovernmental Oceanographic Commission (IOC) of UNESCO

- Only intergovernmental body of the United Nations (UN) system for ocean science
- Established 1960, 152 Member States



# Mandates

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- **UNESCO** – United Nations Educational, Scientific, and Cultural Organization

The purpose of UNESCO is to contribute to peace and security by promoting collaboration among the nations through education, science, and culture.

- **IOC** – Intergovernmental Oceanographic Commission

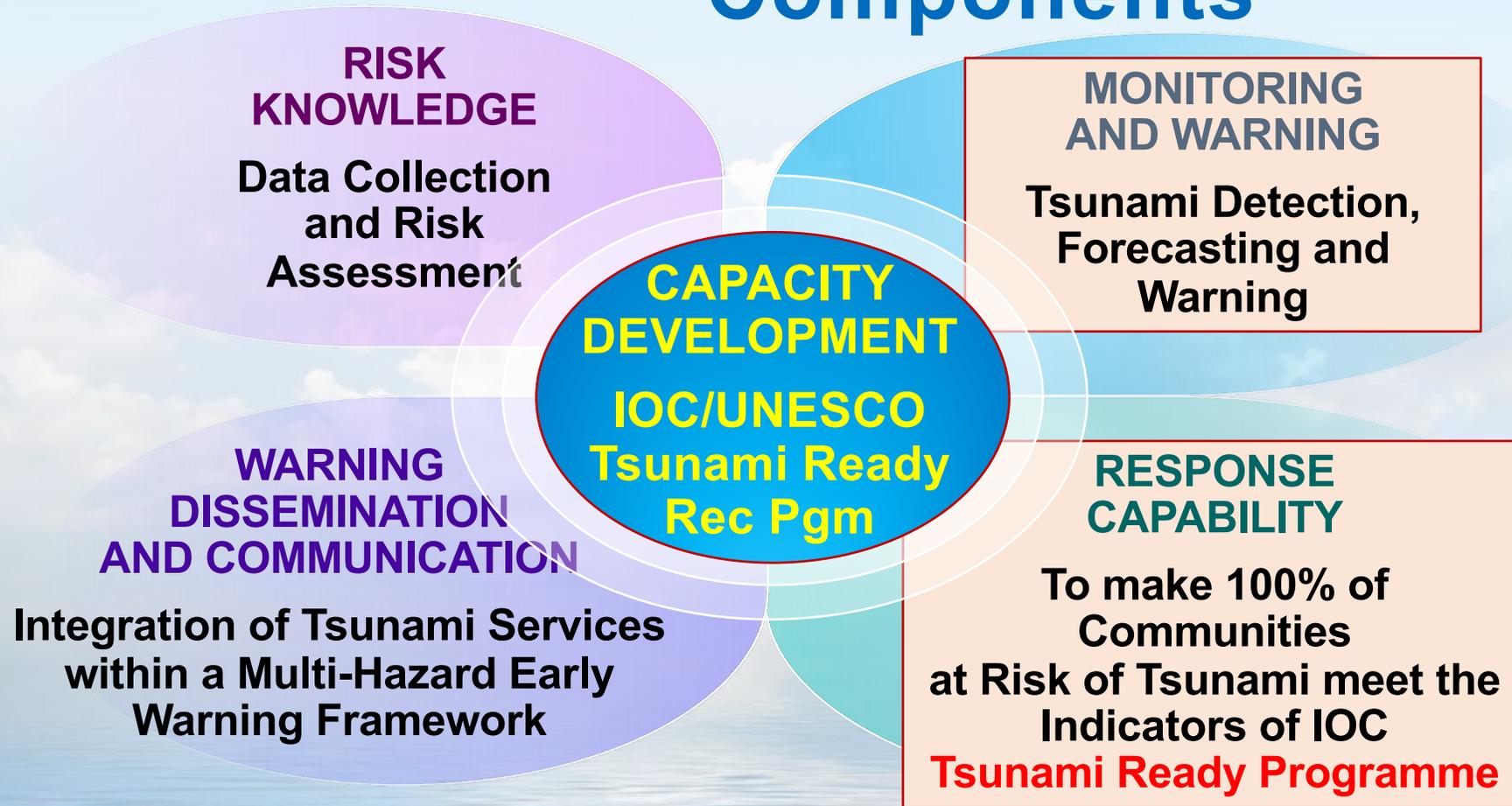
The work of the IOC contributes to the mission of UNESCO by promoting international cooperation in marine sciences through coordinating programmes in capacity development, ocean observations and services, ocean science, tsunami warning and ocean literacy to improve management of the ocean, coasts and marine resources.

- **IOC Tsunami Programme**

The IOC Tsunami Programme, through the coordination of regional meetings, capacity building activities and the support of national and regional projects, aims at reducing the loss of lives and livelihoods due to tsunamis. In order to accomplish this, the IOC Tsunami Resilience Section supports IOC Member States in assessing tsunami risk, implementing Tsunami Early Warning Systems (TEWS) and in educating communities at risk about preparedness measures.

# UN OCEAN DECADE TSUNAMI PROGRAMME

## Components



**Annex 1 to IOC Circular letter, 2825 “Protecting Communities from the World’s Most Dangerous Waves: A Framework for Action under the UN Decade of Ocean Science for Sustainable Development”**  
(6 January 2021)

Angove M et al (2019)

*Ocean Observations Required to Minimize Uncertainty in Global Tsunami Forecasts, Warnings, and Emergency Response.*

Front. Mar. Sci. 6:350. doi: 10.3389/fmars.2019.00350



# Capacity Development

Ensure investment in capacity development for the different stakeholders including the generators and the users of the tsunami early warning system

- National, regional and local level initiatives to reach the objective of 100% at-risk communities to be prepared and resilient to tsunami
- Facilitate equitable access to data, information, knowledge, technology, and infrastructure, leaving no-one behind
- Special consideration to be capacity requirements of SIDS and LDCs



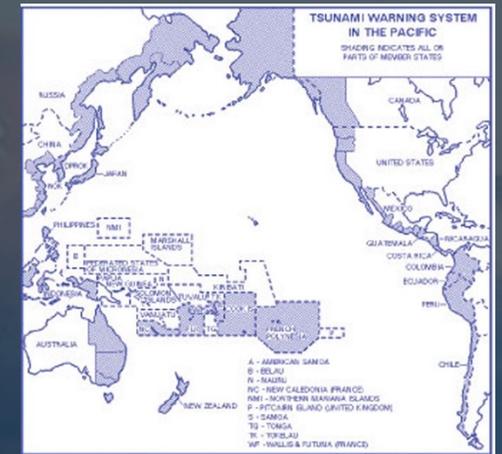
# IOC Tsunami Programme Organization

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- **Four Systems – Each Governed by its Intergovernmental Coordination Group (ICG)**
  - PTWS** - Pacific Tsunami Warning and Mitigation System (46 Member States)
  - IOTWMS** – Indian Ocean Tsunami Warning and Mitigation System (27 Member States)
  - NEAMTWS** - Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (40 Member States)
  - CARIBE-EWS** - Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (48 Member States)
- **ICG Coordinating Body – Covers Common Issues of the Four Systems**
  - TOWS-WG** - Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG)
- **IOC Secretariat – Provides Structure, Continuity and Overall Support**
  - Head of the Tsunami Unit and Technical Secretaries for each ICG
- **Overall Governance** – IOC Assembly and IOC Executive Council

# 1960 Deadly Basin-wide Tsunami

1960 9.5 Mw Chile earthquake generated a tsunami killed 2000 in Chile, then 100s in Hawaii, Japan, and Philippines => No international warning



=> 1965 Pacific Tsunami Warning System (PTWS) est (UNESCO IOC)

- PTWC (US NOAA) – 1965 - PTWS Operational Center HQ
- ITIC (IOC, US NOAA hosted) - Support PTWS

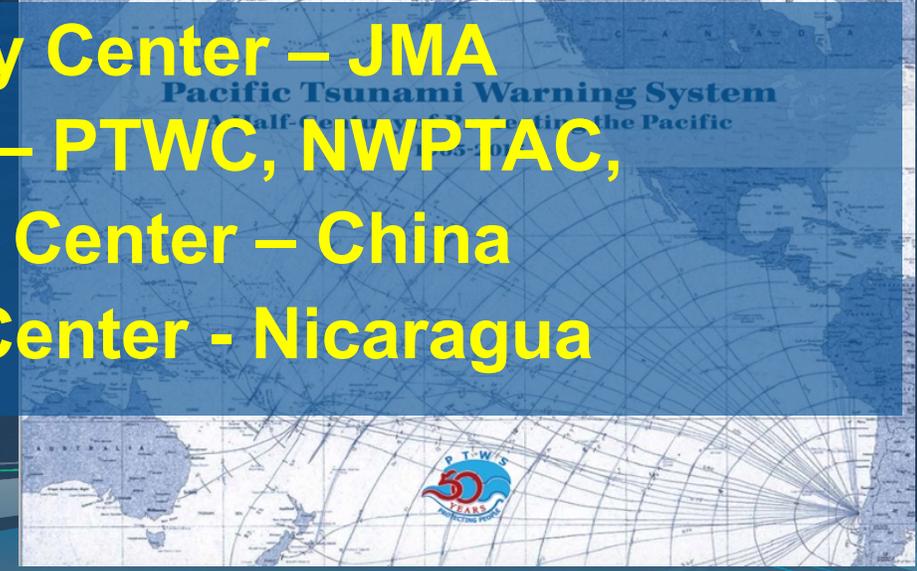
2005 Northwest Pacific Tsunami Advisory Center – JMA

2014, 2017 Tsunami Enhanced Products – PTWC, NWPAC,

2019 South China Sea Tsunami Advisory Center – China

2026 Central America Tsunami Advisory Center - Nicaragua

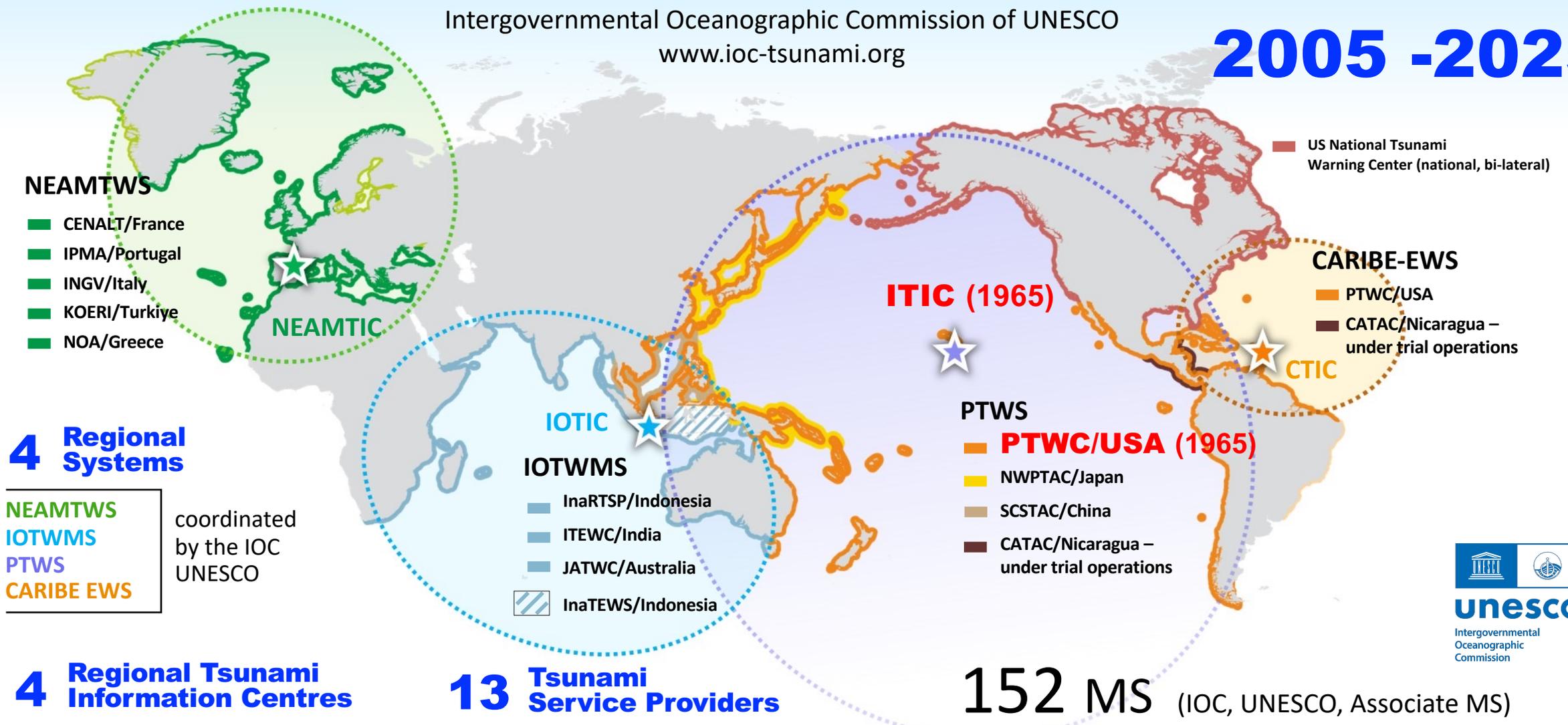
1960 Chile



# GLOBAL TSUNAMI WARNING AND MITIGATION SYSTEMS

Intergovernmental Oceanographic Commission of UNESCO  
[www.ioc-tsunami.org](http://www.ioc-tsunami.org)

## 2005 -2025



### 4 Regional Systems

- NEAMTWS
- IOTWMS
- PTWS
- CARIBE EWS

coordinated by the IOC UNESCO

### 4 Regional Tsunami Information Centres

- NEAMTIC
- IOTIC
- ITIC
- CTIC

Supporting the Regional System

### 13 Tsunami Service Providers

- 5 – NE Atlantic, Mediterranean
- 3 – Indian Ocean
- 4 – Pacific Ocean
- 2 – Caribbean

### 152 MS (IOC, UNESCO, Associate MS)

- 36 – SIDS
- 12 – African

have established National Tsunami Warning Focal Points/ National Tsunami Warning Centres



After Frolov, 2023, IOC update 2025

# UN – How Does it Function?

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- ❑ Providing timely, accurate Tsunami Warning advice by Tsunami Service Providers (TSP)
- ❑ Is based on the joint operation of international networks of detection connected with national tsunami warning centres
- ❑ Governance under UNESCO/IOC
- ❑ Each nation is responsible for issuing warnings in their territory and protect its own population.
- ❑ National warning centres must have strong links with emergency preparedness authorities (national, provincial, local)



# TNC, TWFP, and NTWC of each Member State

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## ■ **Tsunami National Contact (TNC)**

The person designated by an ICG Member State government to represent his/her country in the coordination of international tsunami warning and mitigation activities. The person is part of the main stakeholders of the national tsunami warning and mitigation system programme. The person may be the Tsunami Warning Focal Point from the national disaster management organization, from a technical or scientific institution, or from another agency with tsunami warning and mitigation responsibilities.

## ■ **Tsunami Warning Focal Point (TWFP)**

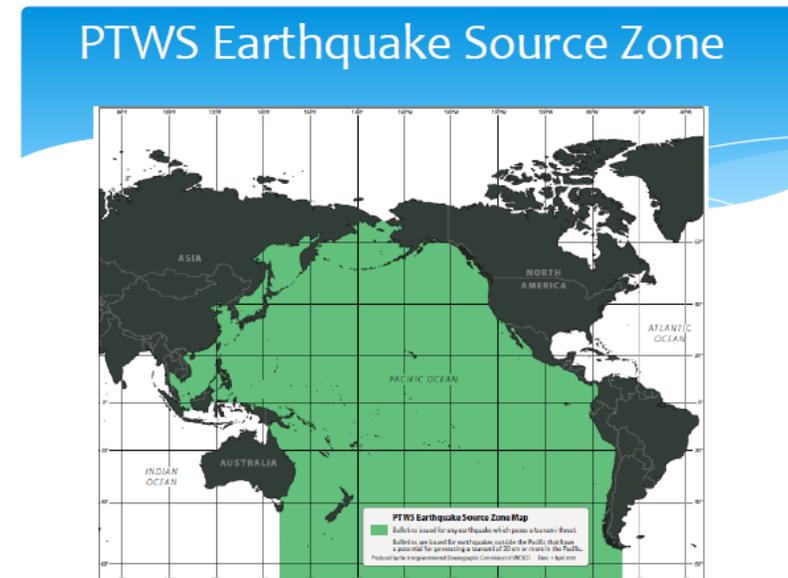
A 24x7 point of contact (office, operational unit or position, not a person) officially designated by the NTWC or the government to receive and disseminate tsunami information from an ICG Tsunami Service Provider according to established national Standard Operating Procedures. The TWFP may or not be the NTWC.

## ■ **National Tsunami Warning Center (NTWC)**

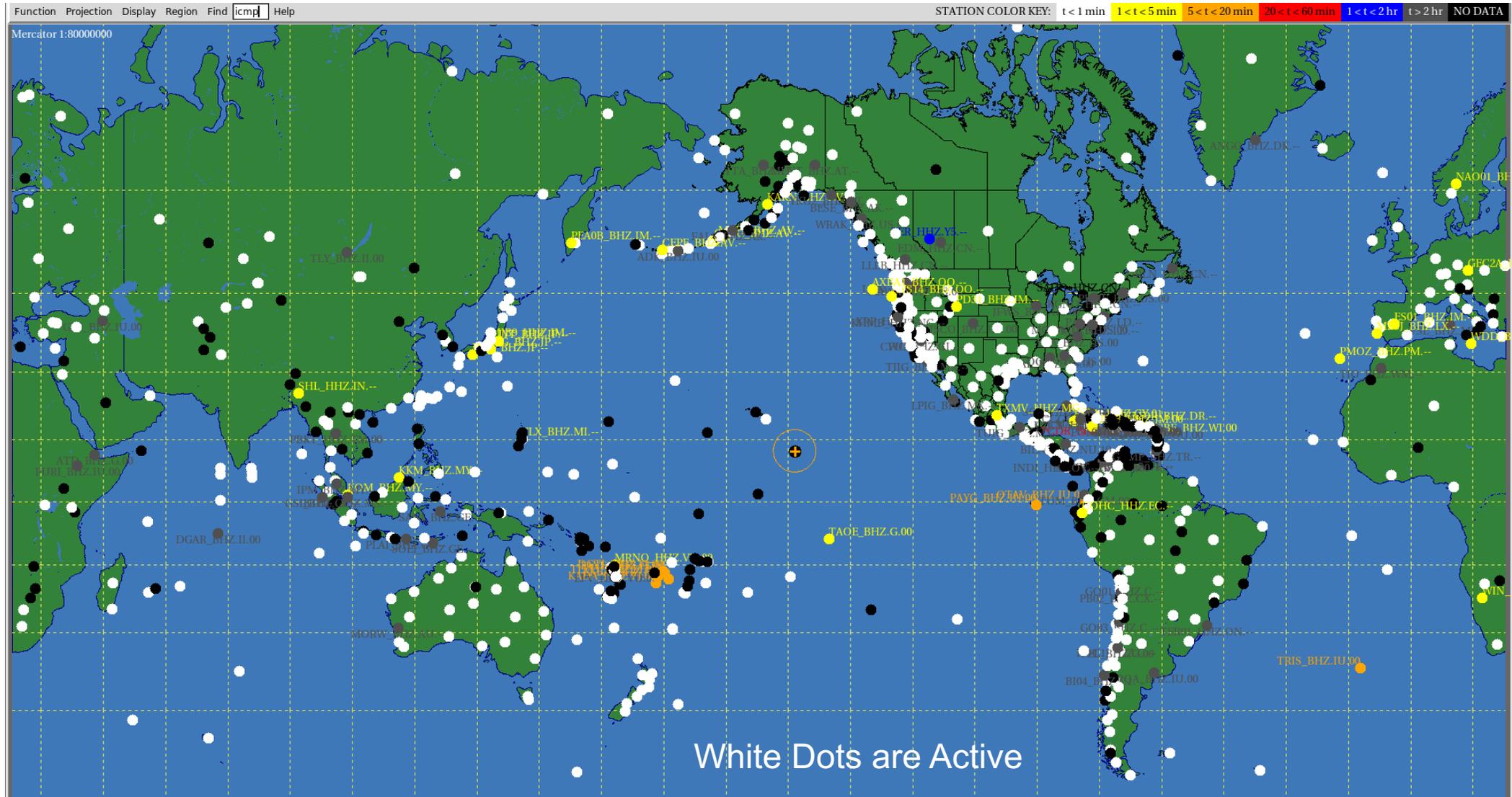
A centre officially designated by the government to monitor and issue tsunami warnings and other related statements within their country according to established national Standard Operating Procedures

# Roles and Responsibilities of the TSPs

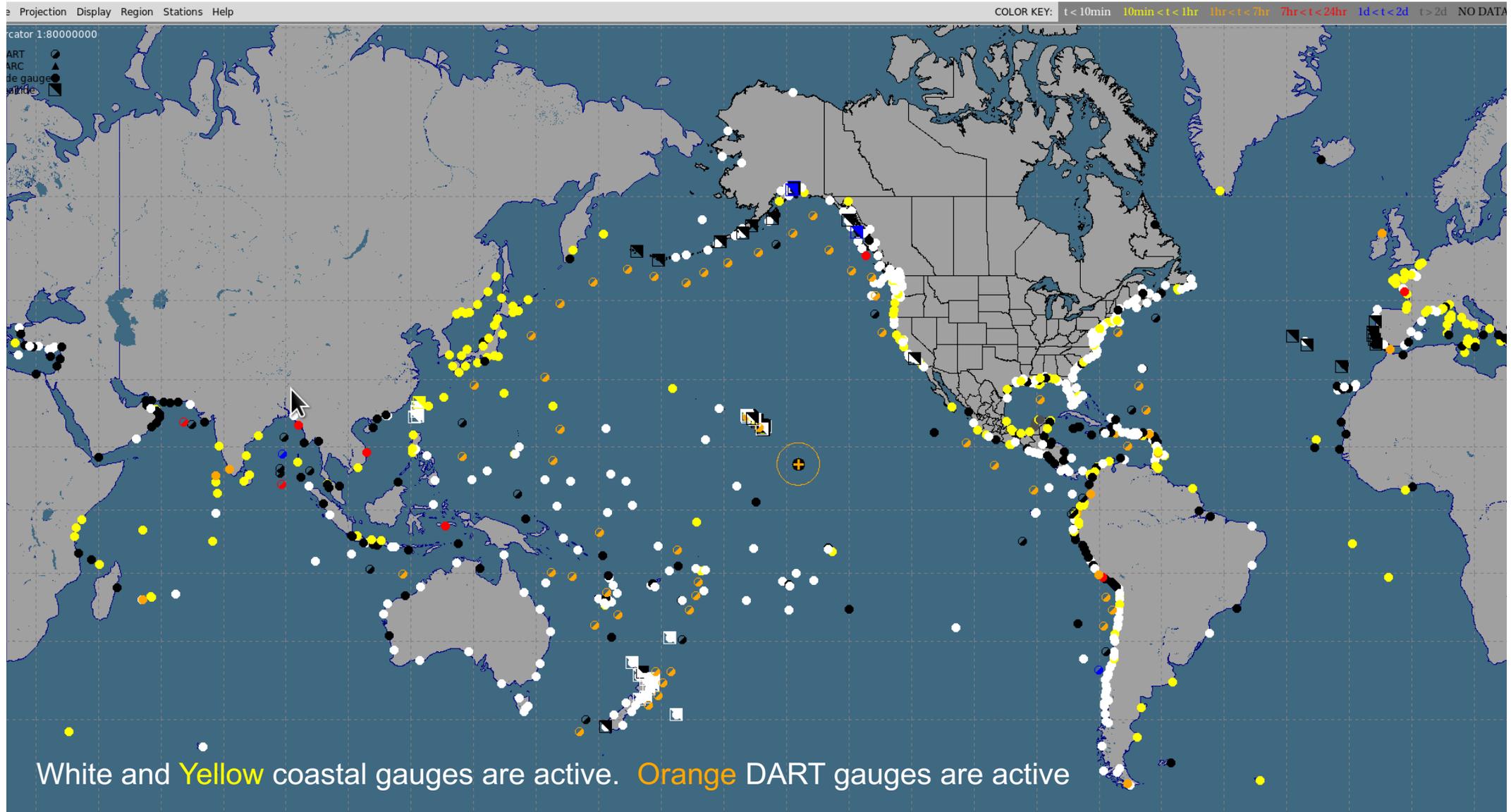
- **Tsunami Service Provider – PTWC, NWPTAC, SCSTAC for PTWS**
  - Centre that monitors seismic and sea level activity and issues timely tsunami threat information within an ICG framework to NTWC/TWFP and other TSPs operating within an ocean basin.
  - NTWCs/TWFPs may use products to develop and issue tsunami warning for their countries. TSPs may also issue Public messages for an ocean basin and act as National Tsunami Warning Centres providing tsunami warnings for their own countries



# Seismic Network Used by PTWC – US and International



# Sea-Level Gauges Monitored by PTWC – US and International



# Roles and Responsibilities of the TIC

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## ■ Tsunami Information Center

Centres that provide education, outreach, technical and capacity building assistance to Member States and the public in preventing, preparing, and mitigating measures for tsunamis. Among other activities, the centres manage post event performance surveys, serve as a resource for the development, publication, and distribution of tsunami education and preparedness materials and information on tsunami occurrences, and may support risk assessment and mitigation activities. A Tsunami Information Centre has been established in each of the regional tsunami warning systems within the ICG framework.

# IOC Tsunami Information Centers



## PTWS

**USA NOAA – IOC Partnership**

Dr. Laura Kong

Christa von Hillebrandt-Andrade

**Chile SHOA Associate Director**

Lcdr. Matías I. Sifón

**1965**

**1998**



NEAMTWS

2011 - 2013 EC DG ECHO

France, Greece, Italy, Portugal

Presently, IOC Dr. Denis Cheng-Seng



IOTWS

Indonesia – IOC Partnership 2012  
(formerly JTIC since 2006)

Ardito Kodijat



CARIBE-EWS

Barbados– IOC Partnership  
2015 (approved 2007)

Alison Brome



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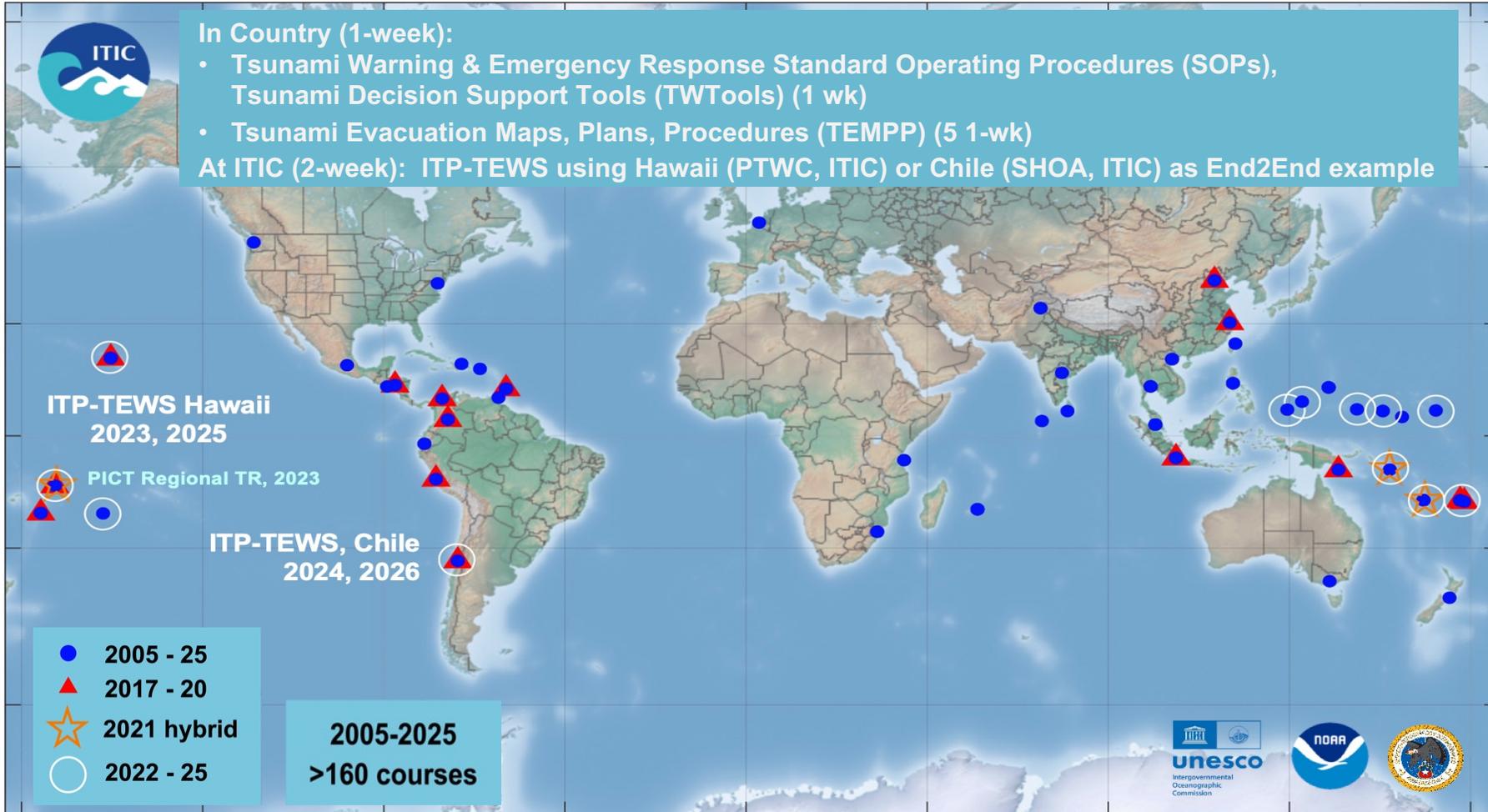
# ITIC Mandate (1977)

[www.tsunamiwave.org](http://www.tsunamiwave.org)  
<http://itic.ioc-unesco.org/index.php>

- **Monitor, recommend improvements**
  - Events – improving warning and response
  - Tsunami Warning Decision Support Tools
- **Assist in establish/strengthen national, regional systems**
  - Capacity Building, Training => Post-2004 and beyond
  - IOC Wave Exercises => test, validate, practice
  - UN Decade for Ocean Science for Sustainable Dev > Resilient communities
- **Information resource - preparedness / education (create, compile, share)**
  - Guides, Manuals, Best Practices, Awareness materials
- **Information resource - historical tsunamis (collect, compile, share)**
  - Database, global and regional hazard, post-event surveys



# Building Resiliency: Capacity Building, Training



**Importance of continual training to strengthen TWC decision-making skills:**

**>> Tonga did well for 2022 HTHH Volcano / Tsunami**

- Many trainings In-Country (5) - 2009, 2010, 2015, 2019
- ITP-Hawaii (14) - 2006, 2009, 2011, 2014, 2016, 2018, 2019



# ICG/PTWS Governance Structure

Chair, Vice-Chairs, Steering Committee: 4 Regional Working Groups, 3 Technical Working Groups, 9 Task Teams

## Inter-Governmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) ORGANISATIONAL STRUCTURE, 2025-2027

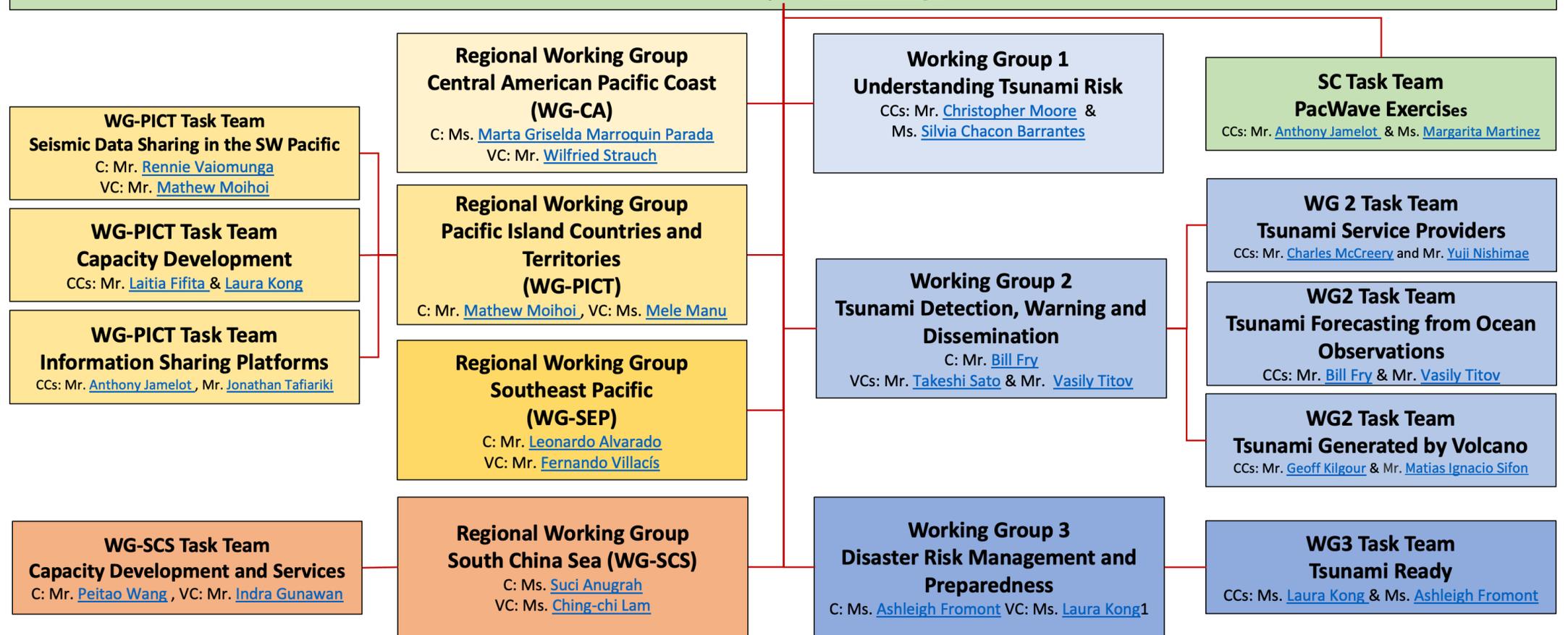
Chair: Mr. [Dakui Wang](#) (China)

Vice-Chairs: Ms. [Lara Bland](#) (New Zealand), Ms. [Mylene Martinez Villegas](#) (Philippines), Mr. [Levu Antfalo](#) (Vanuatu)

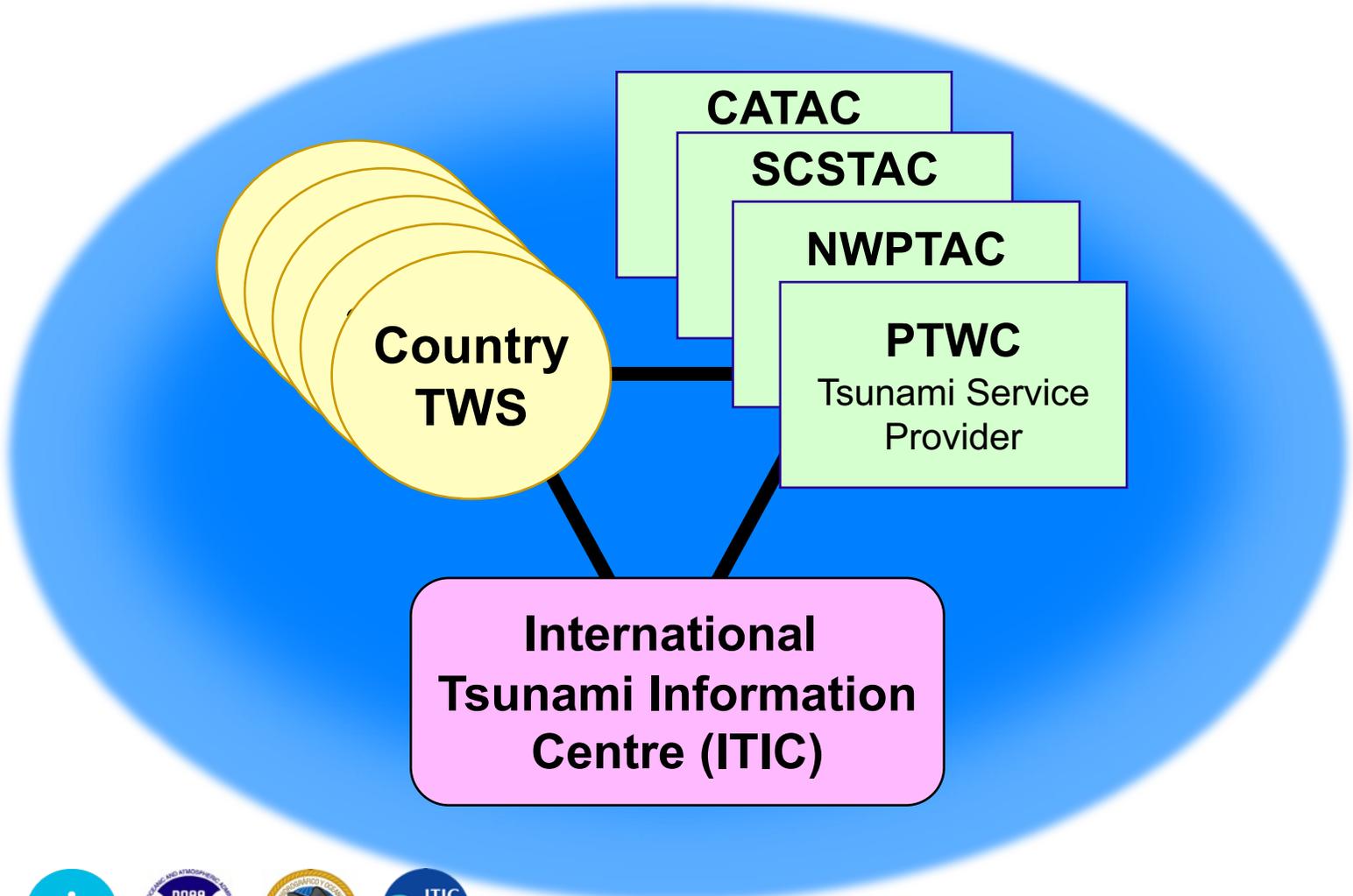
Steering Committee: ICG/PTWS Officers (Chair and the Vice-Chairs), Chairs of the Technical and Regional Working Groups, Directors of the TSPs and ITIC, or their delegates, and other members' representatives by invitation of the Chair.

International Tsunami Information Centre (ITIC): Ms. [Laura Kong](#) (Director) & Mr. [Matias Ignacio Sifon](#) (Associate Director)

Technical Secretary: Mr. [Öcal Necmioğlu](#)



# PTWS FOUNDATIONAL ELEMENTS





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UNESCO/IOC – NOAA ITIC Training Program in Hawaii (ITP-TEWS-Hawaii)  
TSUNAMI EARLY WARNING SYSTEMS  
AND THE PACIFIC TSUNAMI WARNING CENTER (PTWC) ENHANCED PRODUCTS  
TSUNAMI EVACUATION PLANNING AND UNESCO IOC TSUNAMI READY PROGRAMME  
15-26 September 2025, Honolulu, Hawaii USA

# Thank You

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**Dr. Charles McCreery**  
Director, PTWC



# We have gone a long way...

## ITSU renamed

September 2005, Vina del Mar, Chile  
The 20th Session of the ICG/PTWS-XX decides to change its name to the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System

## ITSU development

2005

3 ICGs established

Indian Ocean (ICG/IOTWS), Caribbean and Adjacent Seas (ICG/CARIBE-EWS), Mediterranean and North Atlantic (ICG/NEAMTWS) (IOC/XXIII-11, 12, 13, June 2005)

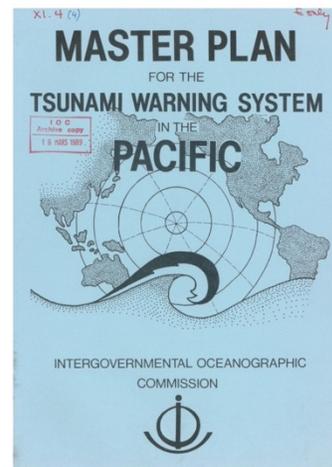
The tragedy brings world attention to the dangers of tsunamis in every nation and initiates the development of warning and mitigation systems in the Indian Ocean

2004

**Indian Ocean Tsunami**

1989

First Master Plan



1977

The Honolulu Observatory renamed Pacific Tsunami Warning Center PTWC

ITSU

IOC/IV-6, International Aspects of the Tsunami Warning System in the Pacific, Paris, November 1965

1965

**1948** the **Honolulu Magnetic Observatory**, under the US Coast and Geodetic Survey (USCGS) established

**1952.** The **Japan Meteorological Agency** started its national tsunami warning center

**1965** - IOC Working Group on the International Aspects of the Tsunami Warning System in the Pacific, organized by the USCGS on behalf of the IOC, Honolulu, 27-30 April 1965

# Remaining challenges...and the way forward



Minamisoma, Fukushima prefecture, Japan. 2011 March 11, Mw 9.0, Honshu, Japan earthquake and tsunami. (Credit: AFP/AFP/Getty Images.)

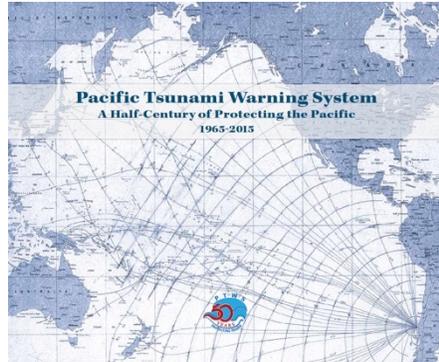
2011 Tōhoku earthquake and tsunami

2011

Inter-ICG Task Team on Hazard Assessment Related to Highest Potential Tsunami Source Areas



2016 ->Recent case studies demonstrated complexity and variability, as well as importance of other types of tsunami sources and that earthquake generated Tsunamis can happen in any subduction zones.



50<sup>th</sup> anniversary of TSU/PWTS

2015



2018

Palu, Indonesia

Landslide generated tsunami



December 18, 2018 December 30, 2018



Volcano generated tsunami

Sunda strait, Indonesia

2018



UN Ocean Decade Tsunami Programme

2022

TOWS Task Teams

The Group decided to establish a specific Ad Hoc Team on Meteo-tsunamis & Ad Hoc Team on Tsunamis Generated by Volcanoes